LGV.
(Agriculture)
File. No. 87
Sl. No 1 to 8
11 to 17 and 21 to 25

Sub:- Remedical Measures against grass-hopper and Hola-grass-hopper pests.

32

GENERAL AND REVENUE SECRETARIAT.

1910
~~190~~.

(Agriculture)

File No. 87 Agri

Serial Nos. 1 to 8, 11 to 17 & 21 to 2

Papers Filed.

Month December 1911

SUBJECT.

Remedial measures against grass-hopper and gola-grass-hopper pests.

PREVIOUS REFERENCES.	LATER REFERENCES.
Agri 71-03 sl 1. + sl. 2.	G.O. 311-1181-3 7 may 1912

D Suryanarayana Rao
6-1-12

G.R.S. 11] 1910.

GENERAL AND REVENUE SECRETARIAT

(Agri)

NOTES.

Agri File No. 87–10

FILE HEADING.

Provision in the budget for 1911-12 for adopting remedial measures against the grass-hoppers pest.

From

The Mycologist & Entomologist

No. 358 Dated 9. 1. 11 Received 10. 1. 11

Diary No. 3499 | Enclos. | Spare Copies | Serial No. 1.

BRIEF ABSTRACT OF LETTER.

Proposes that a provision of Rs 2000 may be made in the budget for 1911-12 for adopting remedial measures against Nili grass-hoppers & Jola-grass-hoppers in the tracts affected by the pests.

NOTES AND ORDERS.

Submitted for orders

18/1/11 (AW)

17/1/11 May be considered at the time of the budget. At present the subject matter the reply will

NOTES—First sheet.

GPB—15,000—24-4-09

Serial No.

consent to lay the cost of the projects each in his own land and without such a consent the amount cannot be recovered. Local officers in the opinion both should be required to interest themselves in the remedial measures & see that the ryots adopt them. Perhaps it will be sufficient to provide a small amount about 500 Rs. for special purchase & supply of plumbs

Secy / 7/1/11

3 Dr Coleman's proposal may be sanctioned irrespective of the prospect of recovery of the amount. If the Rev Dept. cooperate with Dr Coleman there is no doubt that a proper trial can be given to the methods suggested on a large scale & their practical value tested.

Both in opinion) 8/1/11

4 Subd. 20/1/11

20/1/11

8/1/11

Note—Contn. sheet.

GPB.—50,000—12-8-10

G. R. S. 12]
General and Revenue Secretariat.

Agri File No. 87 of 1910-11

Serial No.	
560	5 Hon Secretary the case in which the Rajah Thennadoo Iswara Nadar obtained the interest-free loans came to the help. Apart from the Revenue Department seems to be the best source [illegible] 6/2/11
	6. The file may be sent unofficially to the Rev. Commr. for favour of his opinion. If he thinks the action proposed by Dr. Coleman as desirable and feasible, suitable budget provision may be made. For myself I doubt whether the ryots would like "energetic measures" being taken on their land "under the direct control & supervision" of a Govt. department. The better course seems to be to explain things to the comparatively educated landowners and cultivators and afford all possible help and facility to such amongst them as desire to take protective measures at their own expense. A small vernacular leaflet printed & circulated through Amildars to all patels & Shanbhogues in the affected talukas before ploughing begins may be useful. 21/1/11 6/2/11
	Submitted. 23/1/11

NOTE—Contn. sheet.

GPB—50,000—12-8-10

G.R.S. 12]
General and Revenue Secretariat.

Agr. File No. 87 of 1910-11

Serial No. 7

L-0 63-10 Q 23-1-11 Forwarded in original to the Rev. Commissioner for favour of opinion

BC

23.1.11 Sd/ G.S. Lovett
for Secretary

Ex. C. No. 15 of 1911 4.8 The remedial measures suggested by Dr. Coleman are two viz:-

(1) Deep ploughing, and

(2) Catching of the insects by nets.

Until convinced of the efficacy of the proposed remedies it is unlikely that our ryots would agree to incur the heavy cost required for ploughing deep, but I do not think they would object to the attempt of the experiment belonging to them on small areas at the cost of Government. As in some cases deep ploughing may not be an unmixed advantage and might lead to other complications, the Entomologist will have to select lands where the operation is not likely to be attended with any such risks.

9 Catching of the insects and their destruction has also to be undertaken by Government in the first instance, as ryots will not act up to the advice given unless they see it practised with beneficial results and find it a good object lesson.

NOTE—Contn. sheet.

GPB—50,000—12-8-10

G.R.S. 12]
General and Revenue Secretariat.

Agri File No. 87 of 1910

Serial No.

10 The experiment however is worth trying and the Revenue Department may be made to cooperate in selected localities or villages with the Entomologist. For this purpose the provision asked for may be made in the Budget.

11 It would be interesting to know what action has been taken in Dwarwar and Bellary to combat the pest, where according Dr. Coleman it has prevailed for some time causing serious damage

Dated 30th Jany 1911. Revenue Commissioner.

3154

Submitted for orders
Rules 12 to the Fmil Secy
1/2/11 1/2/11
1/2/11

Subd
2/2/11 13 Inquiries may perhaps be made under the rules
Secy

2-2-11

14 There is no objection to Provision may be made under the circumstances. The information referred to at the end of the Rev. Comm's note may be obtained as it is likely to help Govt in passing orders in the case. The suggestion at the end of my note of 21-1-11 may also be considered. Agri

Note—Contn. sheet.

GPB—50,000—12-8-10

Serial No.

15 Submitted for orders.

T88 (62)

8/2/11 16 Dr Coleman may be permitted
AHC to make the provision he desires
8/2/11 will be taken on the 1st
consideration of the Rev Commr's
the Fin Secy

8/2/11

17. Dr Coleman has already submitted his budget proposals in which he has included the provision he has been asked for. A draft is therefore submitted sanctioning the provision to be made in the budget. Another draft calling for the information suggested by the Rev. Commr is also put up for approval or other orders

It is a question whether the publication of the leaflet as suggested by the Fin Secy before the amalgamation of the Enforcement Branch is desirable

T88 (40)

10/2/11
AHC Secy / 18 The draft orders may
10/2/11 be approved - Dr Coleman
may himself be asked to ascertain
what is being done in Bombay -

Dewan

11/2/11

NOTE—Contn. sheet

10106
11.2.11

GPB—55,000—27.4.09

19.1 Entered in Precedent

Serial No.

for consideration in Budget time
2. Inquire what they have done in the Bombay Dists (Early)
3. Is there any precedent for this early ploughing? Was any such thing done in the case of Coasts?

16/4/11

4. The papers may then be circulated to Councillors. I would sanction the purchase of the ploughs & the rest of it would cost not more than 2 lacs Rs. The outlay will be gradually recouped by the sale of the ploughs

16/4/11

20 1) Issue draft to Govt
also ask Dr C to ascertain fr from Director of Agriculture, Bombay
[The other day I read in the Mail or Hindu of similar operations in Tinnevelly]

2) Let Budget note the subject for bringing up at budget time.
Then circulate.

C/4
17/4/11

G. R. S. 12]
General and Revenue Secretariat.

Agr. File No. 87 of 1920

Serial No.	
	1/ Submitted with a Do to Dr Coleman TSR (W) 18/2/11 From BHG 18/2/11 a 18/2/11.
	To
2	The F. A. R. Rd No 770 Dy 20. 2. 11 Regards that information may be obtained as to what remedial measures have been adopted in the the Bombay & Madras Presidencies against the pest.
	To
3	Dr. Coleman D o No 914 Dy 22. 2. 11 Requests him to address Director of Agriculture Bombay officially and enquire as to the measures adopted in the Bombay Presidency against the pest.
	2/ This may now be sent to Br II for noting & action as required in para 7 & then to return the file for further action TSR (W) HHG 23/2/11 23/2/11

H. Lees 6/5
Sir
for Sir
23/2/11

Note—Contn. sheet.

Branch II

GPB—55,000—27.4.09

G. R. S. 12]
General and Revenue Secretariat.

Agri File No. 87 of 1910 11

Serial No.	
1760	Subz.
23	The item is noted in the list for Consideration at the time of the final budget.
	Hort (86) 23.2.11 24/2/11
	24.2.11
4	From Dr Coleman.
	do 417 dt 22.2.11.
	States that he is expecting a letter from the Deputy Director of Agriculture that he is conversant with the operations carried on in the Dharwar & the Bellary districts & that he will address the Director of Agriculture, Bombay, if it is still considered necessary to do so.
	Submitted
	TSR (60) 24 25/2/11 — The letter from the Dy Dir of Agriculture may be awaited. It seems to be unnecessary for him to address the Dir of Agriculture, as he is of opinion that he will not be able to give much time

NOTE—Contn. sheet.

GPB—50,000—12-8-10

G. R. S. 12]
General and Revenue Secretariat.

Agri. File No. 87 of 1910

Serial No.

much more light on the subject. After this is invited to the penultimate para of Dr Coleman's d.o. it may be necessary to disabuse his mind of the impression it seems to have by informing him that the enquiry was made as a simple matter of business and not in connection with that meaning any reflection on the thoroughness of his investigation

25 Sub° to Dewan for perusal.

10380
3.3.11

Please put up a d.o. to Dr Coleman

Submitted with a draft.

29 Issue

NOTE—Contn. sheet.

GPB—50,000—12-8-10

G.R.S. 12]
General and Revenue Secretariat.

Agri File No. 87 of 1910

Serial No.

D. O to Dr Coleman

No 105 Dy 17.3.11.

Informs him that he need not make the enquiry suggested in 81 3

31 Please see page 7 There is no precedent regarding the outlay for remedial measures in any parts of the Province similar to those under Consideration. There is some correspondence regarding the presence of locusts in the Chitaldrug district in 1934 but no action was taken as no damage to crop was reported.

No reply has yet been received from the Residency on the enquiry made in 81 2

May these papers be Circulated to Councillors as directed in para 8 & submitted

TSR (Ag)
27/8/11
31 Gen
28/3/11
32 Secy
29/3/11
29/3/11
1832
2/4/11
3/4/11

2583
5.4.11

37 The grasshopper pest threatens to spread from year to year

v. J. 2. V
But the principle upon which remedial measures are based in the Coorg Rebellion is the same. It is now suggested to the Residency by preventing locusts on a large scale. These operations have at any rate in the beginning Started with a similar Object

NOTE—Contn. sheet.

GPB—55,000—27.4.09

G. R. S. 12]
General and Revenue Secretariat.

Agri File No. 87 of 1910

Serial No.

and the efforts of Dr Coleman to quench it deserve our support. I would sanction the grant to allow Dr Coleman to carry on his experiments

WR 1/4/11

84 sub to Dewan after circulation

109 3.1 — 5.4.11

35. Letter from Mr Coleman with Budget Estimate

WR 1/4/11

L 5/4/11

36. Br I & II to note & submit with final budget

CBS 12/4/11

a 1/4/11

37

H Revs 905

(This may be sent) to Br II

CS WR 1/4/11

Branch II

12/4/11

12/4/11

A provision of Rs 2000 was sanctioned for medical treatment of Mr Coleman

1/4/11

Subd

89.54 5/4/11

NOTE—Contn. sheet No. 2

38.

15/4/11

15/4/11

15/4/11

G.R.S. 12]
General and Revenue Secretariat.

Agr. File No. 87 of 1910

Serial No.	
6	From The First Asst Resident No 2627 dy 2.5.11 Forwards a note prepared by the Entomological Asst in the Madras Presidency on the Jowar Hopper in the Bellary District & the remedial measures adopted against the pest. 39 Submitted A copy of the note may be sent to D Coleman TSR (Ag) 4/5/11 CS 4D. 4n & 5n7
41	Submitted with draft TSR (Ag) 8/5/11 CS 42 Issued & 5n7
7	To The Mycologist & Entomologist No R 6228 dy 12.5.11 Forwards a copy of the note for information

NOTE—Contn. sheet.

3PB—55,000—27.4.09

Serial No.	
8	From The Mycologist & Entomologist No 6688 R 13.5.11 States that a copy of the note was already in his possession.
X 11	From The First Asst Resident No 3224 R 29.5.11 Forwards for the information of the Durbar a copy of a note prepared by the Director of Agriculture in Bombay on the subject of Coco Lopper pest and requests to be furnished with a report of the measures adopted by the Durbar in exterminating the pest for transmission to Bombay Govt.

Subd 43. The budget is before Council.
Dr-133 It will take some time before
1/6/11 Dr Coleman can submit a report.
C.P.
1.6 44 The steps proposed to be taken by Dr Coleman were published in the Gazette. Please put it up Dr Coleman may be

NOTE—Contn. sheet.

G. R. S. 12]
General and Revenue Secretariat.

File No. of 190

Serial No.	
	asked to furnish a further report in continuation
	& 1/6/11
	45 Ended
Hdqrs P & R.	Gazette part 4 and draft Rules Hkr-133. Please see D. o. N° 105 of 17. 3. 11.
	2 6/11 As Mr Coleman says that he is possession of information relating to Dharwar it seems unnecessary to send him this note. He may merely be asked to furnish a report in continuation of what is published in the Gazette.
	Cl 2.6.11 46. I have put up a clean draft & also a draft letter to Bridge forwarding the printed extract from Mr Coleman's diary & stating that a further report has been called for which will be forwarded on receipt
	& 6/6/11.
	47 Submitted with 3 drafts Hkr-133 5 6/11 Cl 48. I have & 6/6/11
	To Supt Govt Press. D.O. no 160 of 6.6.11 Calls for 3 spare copies of Pt IV of the Gazette cont. Mr Coleman's report.
12	From Supt Govt Press. D.O. of 7.6.11 To the above 3 spare copies.
	To H. & R.
	No Pol (O.T.) R. Dt. 6.6.11.
	Forwards a printed extract from

NOTE—Contn. sheet.

GPB—55,000—27.4.09

G. R. S. 12.]
General and Revenue Secretariat.

Agri. File No. 87 of 1910

Serial No.	
	a D.O. letter No 332 R 16.12.10 from L.C. Coleman on the subject and states that a further report will be forwarded on its receipt from Dr. Coleman.
13	To The Mycologist & Entomologist No. R.6635 R 8.6.11 Requests him to report whether any other measures than those described in his D.O. letter No 332 R 16.12.10 have been adopted since in exterminating the pest, as the Bombay Govt desires to be furnished with a report on the subject.
	From
14	The Mycologist & Entomologist No. 665 R 10.6.11 states that a full & exhaustive bulletin on the subject has been prepared by him & will be issued on receipt from England of some coloured plates illustrating the bulletin, that it gives an account of the work already done and that ~~[illegible]~~

NOTE—Contn. sheet.

GPB—50,000—12-8-10

G. R. S. 12]
General and Revenue Secretariat.

Agr. File No. 87 of 19

Serial No.

a great deal still remains to be experimented upon, and it is being done. 49 may the Residency be informed accordingly, in continuation of the previous Communication on the issue of bulletins, awaited? 50 We may await the receipt of the promised bulletin for which a reminder will be sent after a week.

Subd
Ukr-133
15 6 II

51. Yr
&
6/6/11

52 Dr Coleman states in his letter 2069 & 21-6-11 submitted today, that the plates for his bulletins have not yet been received from England. May his further report be awaited?

Ap: 89-10-3

Subd
Ukr-133
24 6 II

53. Yr
&
26/6/11.

15. From The First Assistant to the Resident in Mysore.
No. 4248 918. 7. 11.

States that it is reported that a number of villages in the Bellary Dt are affected with the grasshopper pest and that the Collector of Bellary desires to try the type of the bag

NOTE— Contn. sheet.

GPB—50,000—12-8-10

G. R. S. 12].
General and Revenue Secretariat.

Agri File No. 87 of 19 10

Serial No.	
	used in Mysore and requests, at the instance of the Govt of Madras, that the Collector of Bellary may be supplied direct with some sample bags at a very early date and the fact intimated to the Resp-
	54 Draft letter to Dr Coleman is submitted.
	(55) 19.7.11 55. How was a copy of the bulletin been received? I saw a review of it in some paper the other day.
	56.
	To
16	The Mycologist & Entomologist
	No. R. 5148 dt 19.7.11
	Requests him to supply the Collector of Bellary with some sample bags & intimate the fact of his having done so with a memo of costs.
	From
17	The Mycologist & Entomologist
	No 6 dt R. 26.7.11.
	Reports that he has sent five sample bags of the kind recommended by him with a copy of his bulletin

NOTE—Contn. sheet.

GPB—50,000—12-8-10

G. R. S. 12]
General and Revenue Secretariat.

Agri File No. 87 of 1910

Serial No.

which contains instructions for their use, the cost of the bags being Rs 3-2-5.

56 A Kannada Copy of the bulletin has been received & is put up. Nothing is said about the English copies. May Dr Coleman be requested to state what he has done with the English Copies, as a few are required to be sent to Govt of Bombay?

Subd
IKr-133
28 7/11 Cl 5-7-11

28/7/11

58
(1) Draft subd
(2) Orders are solicited as to whether it is necessary to request the Collector of Bellary to remit the sum of Rs 3-2-5 being the cost of the bags sent to him, vide paper under disposal.

IKr-133
31 7/11 59 (1) Issue (2) Yes. Move put up
8.11 draft

1/8/11

To

The Mycologist & Entomologist
No. 2944 R 2.8.11

NOTE—Contn. sheet.

GPB—50,000—12-8-10

G. R. S. 12]
General and Revenue Secretariat.

Agri File No. 87 of 1910

Serial No.

Requests him to send 20 Copies of his bulletin in English to this office, if they are ready.

60. Draft to the Residency is put up:

Lubd 61 & the amount is small
Hkr-133 & it may not perhaps be necessary
3/11 to close it

Sig/ 3/11/11

62. Draft may be approved

1295 9/11/11

Dewan 8/11/11

Draft approved by Dewan 11. 11.

Issue

8/11/11

21 To the Dy Resident 61.

Letter PR no 412 & 8-11-11

With refce to 8 re 15, informs him that the Collr of Bellary has been supplied with samples bags for catching grass hoppers & requests that arrangements may be made to get the cost of the bags Rs 3-2-5 per the Collr of Bellary & remit the same & the Duplicate

NOTE—Contn. sheet.

GPB—50,000—12-8-10

[G. R. S. 12]

General and Revenue Secretariat.

Agl. File No. 87 of 1910.

Serial No.	
22	From the Dy Collector in Charge of the Treasury, Bellary No D Dis 1216-1911 & 29.11-11 Forward a remittance Transfer Receipt for Rs 3-2-5 being the Cost of 2 bags for trapping grass-hoppers supplied by Dr Cleman and requests an acknowledgment A draft of an acknt is subd. The R.T.R may be sent to the Cash Section for getting it cashed at the Resident's Treasury. Pass. (55) 2.12-11 To Cash Section to take delivery of the Transfer Receipt CA 2.12.11 The R.T.R returned for being cashed as desired above. Please note as to how the amount has been disposed of MM 4-12-11 Subd The amount has to be sent to Dr. Cleman as it is a miscellaneous receipt for the Agl Department, or

NOTE—Contn. sheet.

GPB—5,000—26-6-11

Serial No.

It may be credited to the Treasury as such & Dr Coleman informed qit in reply to his letter dy 26.7.1911 (8th no 17)

Accts
(55) 4.12.11
Cl

may be credited to the Treasy. Dr Coleman informed qit

Draft forwarding the amount to Dr Treasy Mice for being credited to the Treasy as a mis receipt for the Agl Debs XVI Principl & other minor Heads is subd. The other draft (aicht Accts (55) 6.12.11 Cl to the Bellary Treasy Mices) may also be approved

2 drafts subd
Cl
6/12/11

23 To the Dy Collr in charge of Treasy Bellary. No 2578 dy 14.12.11
Acknowledgs receipt of R.T.R forwarding Mo 22

NOTE—Contn. sheet.

G. R. S. 12]
General and Revenue Secretariat.

Apl File No. 87 of 1911

Serial No.	
	To
24	The Officer in charge of the Dt Treasury Bangalore
	No R 3529 dy 14-12-11
	Forwards the sum of Rs 3-2-5 and requests that the amount may be credited to the Treasury under the head XVI Scientific & Other Minor Depts (3) Agl—Dept— & his receipt.
	No R 3580 dy 14-12-11
	Forwards copy of the above with reference to his letter no 68 dy 26-7-11. (Srno 17)
25	From The officer in charge of Treasury Bangalore Dt.
	Receipt dy 15-12-11 for amount of Rs 3-2-5 sent with Srno 24.
	Sd/- This may now be filed
	Bang Cl (53) 22/12/11
	Sd
	24/12/11

NOTE—Contn. sheet.

GPB—50,000—12-8-10

DEPARTMENT OF AGRICULTURE
CHEMICAL LABORATORY
No. 358
GOVERNMENT OF MYSORE

Agri 87-10-Sel 1

Office of the Mycologist & Entomologist,
Government of Mysore,
Bangalore, January 7th 1911.

From

Leslie C. Coleman, Esq., M.A., Ph.D.,
Mycologist & Entomologist to the Government of
His Highness the Maharaja of Mysore, Bangalore,

To

The Secretary to the Government of
His Highness the Maharaja of Mysore,
Genl. and Rev. Departments, Bangalore.

Sir,

In connection with the work of the entomological laboratory during the past year two serious insect pests have been receiving special attention. These are the Rice Grass-hopper (Hieroglyphus banian) which attacks both paddy and sugar cane and which has been reported from Sorab, Shikarpur, Tarikere and Yedatore Taluks, and the Jola Grass-hopper (Colemania Sphenarioides) which has been doing serious damage on practically all dry land cereals (Jola, Navane, Sajje and Ragi) and more especially on Jola in Honnali, Chennagiri, Davanagere, Jagalur and Chitaldrug Taluks. The results of investigations and demonstrations on both of these pests will be published in the form of bulletins before the close of the official year.

2. In connection with both of these pests much practical work has been done in the field and the results are, on the whole, gratifying. In all such work where the pest is spread over wide areas co-operative effort is absolutely essential to bring about satisfactory results. Where such co-operation is not present the work done runs great danger of being wasted and of course the ryots look upon such failure as a result of mistaken or

impractical methods and not as a result of their own inaction.

3. The work this year has been attended by the greatest difficulty in this very respect. This department is clothed with no authority to enforce the carrying out of preventive and combative measures and everything had to be done through continuous persuasion. Some few of the ryots carried out the measures advised and demonstrated by the department thoroughly but the majority of them worked in a half hearted way with the natural result that the work was only partially successful. That a great deal of valuable time had to be wasted on account of the inactivity and indifference of the ryots goes without saying.

4. In the case of many diseases and pests slow progress though unfortunate is after all not disastrous from the fact that these diseases and pests are ones of long standing and though they take their yearly toll from the ryot still there is no great danger of their continued increase and spread. Such are, for example, Koleroga and many of the insect pests of Mysore which have been doing damage for very many years.

5. In the case of both Grass-hopper pests under consideration we have however conditions quite different and this particularly true with regard to the Jola Grass-hopper. This is a pest which upto the last year had never been recorded as doing any damage in any part of India. We now know that it has been existant as a pest for probably about six years. It was no doubt existent long before that but in all probability previous to that time it had confined itself to grass and other wild plants for food.

6. Some six years ago it began to attack Jola and other cereals and adapted itself to the new food and the new conditions with astonishing rapidity. With this better food supply it has increased at an alarming rate with the result that it is now doing most serious damage over quite large tracts in Dharwar and Bellary Districts and in the Taluks of Mysore already mentioned. It appears to have appeared as a pest first in Dharwar District and to have spread from there into Mysore. This spread in Mysore

must have taken place within about four years and when we consider this fact I can see no reason why it should not continue its spread throughout parts of the State where Cholum and Ragi is grown and that means practically the whole State.

6. We have records of similar pests in other countries and I need only cite the cotton boll weevil in the United States which within the last ten years has spread all the way from the Mexican border right across Texas and and into Louisiana over an area immediately bigger than Mysore State. The losses caused by it have been enormous and the United States Department of Agriculture have had a staff of about ten highly paid entomologists at work on it for over five years in addition to the Entomological staffs of the different ~~xxxxxx~~ states affected.

7. In the case of this as in that of many other pests the Government did not realise the seriousness of the situation until the pest had become firmly established with the result that the difficulty of combating the pest has been increased enormously.

8. Having these records of the past in mind and knowing the possibility of a similar result in Mysore I feel I should not be doing my duty if I did not warn Government of the danger. I sincerely trust that in this case the expected may not happen but it seems to me a mistaken policy to trust to providence in the matter.

9 Now as to what in my opinion should be done:- As stated already the measures carried out during the past year were where thorough distinctly successful. The difficulty lay in the impossibility of getting the ryots to co-operate. Under these circumstances I believe that energetic measures should be taken throughout the whole affected tract and under the direct control and supervision of this department. The chief work consists of two parts (a) deep ploughing to bury the egg masses of the grass hopper and (b) banging on the young crops to catch the young grass hoppers soon after they hatch. The first of these if done at all must be done in May and June. It would necessitate the

purchase of a number of ploughs and hiring them out to the ryots. The second would have to be done in July and would necessitate a small outlay for the purchase of bags and a large one for engaging men to carry on bagging operations. This could I believe, be recovered from the ryots and land holders whose lands are protected. I am very desirous of trying the deep ploughing over one whole village at least. The present stock of big ploughs is about twelve and these would be sufficient for a village. They would however have to be purchased from the implement depot as naturally they would be hardly available for sale at full price after having been used. In all I believe a sum of Rs2000/- should be made available and I am proposing this as an item to be included in the next year's budget. I respectfully request you to lay the matter before Government for their consideration. I may point out again that the full sum might be recovered as a special levy on the parties interested.

10. I do not wish to be considered by Government as a sensation monger. Should Government consider the proposal as ill advised I shall, of course, make every effort to combat the pest with the means at my disposal but I feel I should not be doing my duty if I did not express the decided opinion that such means are quite inadequate to meet the emergency.

I have the honor to be,

Sir,

Your most obedient servant,

H. Krishnaiyar

for Mycologist & Entomologist.

Sair Draft Ag Agri Feb no 87-65
& no 2

G.R.S. 48]

Rel. No. 770
Sec 1.

GOVERNMENT OF H. H. THE MAHARAJA OF MYSORE.
GENERAL AND REVENUE SECRETARIAT,

Dated Bangalore, 20th Feby. 1911.

FROM

C. S. BALASUNDARAM IYER, ESQ., B.A.,
Offg. Secretary to the Government of H. H. the Maharaja of Mysore,
General and Revenue Departments.

To

P. B. WARBURTON, ESQ., I.C.S.,
First Assistant to the Hon'ble the Resident in Mysore.

Sir,

I am directed to state that the Entomologist to the Durbar reports that the grass-hopper pest which attacks jola and other crops has appeared in some of the Districts of the State and that it has prevailed for some years in the bordering Dharwar and Bellary Districts. I am to request you to kindly obtain information as to what remedial measures have been adopted in the Bombay and the Madras Presidencies to combat it and whether its ravages have been checked.

A copy of Dr. Coleman's letter is forwarded for your information.

I have etc.,

GPB—1,000—20-12-10.

Fair Copy

C S Balasundaramayya
Offg. Secretary to Govt.

6

G.R.S. 26]

2 copies

Agi File No. 87-10

Serial No. 2

Diary No. of letter replied to 3499.

Pol No. 770

8-20-2-11.

General and Revenue Secretariat

( )

, the 19

To

The F A R.

Sir

Date of issue

Signed by

I am directed to state that the Darbar have been given to understand that the grass-hopper pest has for several years been doing damage in the Dharwar & Bellary Districts in British India and that the same has spread Hemipteron spread to several districts of the State and to request you therefore to be so good as to obtain for the information of the Darbar on account of any action that may

over.

Enclosure 2 to the Durbar reports that the grass-hopper pest which attacks jola & other crops has appeared in some of the districts of the state and that it has prevailed for some years in the bordering Dharwar & Bellary Ds. I am

SUBJECT.

Cold

G.R.S. 26]

Agri File No 87-C0

Serial No. 3

Diary No. of letter replied to

D.O. No. 94-81/22/2/11

4/2/11

General and Revenue Secretariat

( )

, *the* 19

To

Dear Dr. Coleman.

Date of issue 22.2.11

Signed by Noc. P. Co. D'Souza

In Connection with your letter No 358 D 7.1.11 regarding your request for a provision of Rs 2000 in the ensuing budget for taking remedial measures against grass-hopper pest I am directed to request you to kindly address the Director of Agriculture Bombay and enquire for the information of Govt whether any and what remedial measures have been adopted against the same pest stated to have been

over.

SUBJECT.

G.R.S. 26]

Agri File No 87-co 7
Serial No. 3

Diary No. of letter replied to

D.O. No. 94. Dt 22/2/11

22/2/11

General and Revenue Secretariat
( )
, *the* 19

To

Dear Dr. Coleman.

Date of issue 22. 2. 11

Signed by Hon'ble Mr. D'Souza

In Connection with your letter No 358 Dt 7. 1. 11 regarding your request for a provision of Rs 2000 in the ensuing budget for taking remedial measures against grass-hopper pest I am desired to request you to kindly address the Director of ~~Agri~~ Agriculture Bombay and enquire for the information of Govt whether any and what remedial measures have been adopted against the same pest stated to have been

over.

~~done~~

SUBJECT.

I later it prevails in the
Edong damage in the
Dharwar District.

Yours sincerely

Q

List of enclosures,

Copied by 4-2-11

Examined by

GPB—6,000—1.5.09

D. G. No 417 Apl 87-10-86 Ep 9

Office of the Mycologist & Entomologist,
Government of Mysore,
Bangalore, February 22nd 1911.

Dear Mr. D' Souza,

1 Your D.O. No. 94 of the 22nd February is just received. I have already ascertained from the Department of Agriculture, Bombay what ~~is being~~ has been done there re Grass-hopper pest in Dharwar.. I quote from a letter received from the Deputy Director of Agriculture in charge of Dharwar District." In the season just over, I conducted a special campaign in the Ranibennur Taluk of the Dhrwar District, a copy of the report on which will be shortly sent for your perusal". x x x " The combative measures adopted hitherto have been confined to netting " (i.e bagging)

2 The report mentioned has not yet been received but I may say that Ranbennur is only a short distance from Harihar and reports of work there had reached me as early as last August. In November I sent one of my most trusted officers to tour through that Taluk and ascertain just what had been done and with what success. He reported as follows:- " Bagging operations were begun there later than by us and it appears at least in most cases, when the Chlum was already too high for it to be effective. Their bags were much smaller than the ones used by us (about half the width). Campaign was conducted by the Superintendent of the Experimental Farm, Dharwar and was carried on just while he was present. When he left the people stopped bagging. Bagging was done at the most three or four times and the ryots reported to my officer that the results had not been satisfactory ".

3 As far as I can at present gather the chief differences between the work done here and in Dharwar are as follows:-

1. No deep ploughing was tried in Dharwar.

2. Their bags were smaller than ours and in my opinion too small for the best results.

3. Bagging was not begun early enough in Dharwar with the result that the Jola was in many cases already too high for good work.

4. A comparatively short demonstration appears to have been given in Dharwar while here an officer was kept practically constantly on the spot for over three months and a persistent attempt was made to have the work carried on thouroughly throughout a whole village.

4 In addition I may say that I have no doubt that I have a much greater mass of accurate information as to the life history of this pest than they can possibly have in Dharwar and so am in a decidedly better position to decide upon what should be done.

5 If I may be permitted to speak somewhat plainly it seems to me your letter reveals a slight lack of confidence in me on the part of Government. It might, I think, have been almost taken for granted that I was fairly conversant with what was being attempted elsewhere (not only in Dharwar but also in ~~Kxxa~~ Bellary) before sending up my recommendations to Government.

6. I shall be glad to send the copy of the report referred to by the Bombay Deputy Director to you when it arrives and I am of course quite willing to address the Director of Agriculture if it is still deemed necessary. He can, however, hardly furnish me with more information than I already possess and than I have given you in this letter.

Yours sincerely,

Leslie Coleman

G.R.S. 26]

Agri File No 87-10

Serial No. 5

17/3/11 Diary No. of letter replied to 4105

D. O. No. 105

General and Revenue Secretariat

( )

, the 19

Date of issue 17.3.11

Signed by Mr P.G. Edwards

To

Dear Dr Coleman

In reply to your D.O. no 417 & 22.2.11 regarding enquiry you were requested to make from the Dept of Agriculture, Bombay on the remedial measures if any adopted against grass-hopper pest in the Dharwar District I am desired to inform you that you need not address the Director of Agriculture in the matter as you consider that no further light can be thrown on the subject (vide your memo) and to add that the enquiry was intended to be made as a simple matter of information without meaning anything

June 6

over.

SUBJECT.

12

more or much less reflection on the thoroughness of your investigation, was any intended

Yours sincerely,

CBM

16/3/11

BK

List of enclosures,

Copied by

Examined by

GPB—6,000—1-5-09

L135

Agri 87-10-82.6 Pol: 1793

I

No. 2624

2-5-1/82.

2-5-11

5144

FROM

P. B. WARBURTON, ESQ., I. C. S.,

FIRST ASSISTANT TO THE RESIDENT IN MYSORE.

To

The Dewan of Mysore.

Dated Bangalore, 22 May 1911.

SIR,

I am directed to acknowledge the receipt of Mr. Balasundaram Iyer's letter No.770-Pol., dated the 20th February 1911, and, in reply, to forward herewith a note prepared by the Entomological Assistant in the Madras Presidency on the Deccan Grasshopper in the Bellary District and the remedial measures adopted for dealing with the pest, together with a sketch showing the areas affected.

2. A separate communication will be made on receipt of a reply from the Government of Bombay in respect of that Presidency.

I have the honour to be,

Sir,

Your most obedient servant,

First Assistant Resident.

R. P. B.—21-1-1911.—4,000.

A NOTE ON THE DECCAN GRASSHOPPER IN THE BELLARY DISTRICT.

1910-1911.

Distribution.- At present in the Madras Presidency it is confined to the Bellary district. Even in this district it is restricted to parts adjoining the Bombay Presidency and the Nizam's Dominions. It is found throughout Hadagalli taluk, in parts of Harpanahalli and Kudligi and Adoni and in a small portion of Alur.

Remedial Measures.

1. Ploughing.- Ploughing the fields in December and January with the country plough was thought advisable under the idea that the egg masses dislodged and brought up by the plough would be scorched by the severe sun of the summer months. Some fields at Hadagalli were taken up this year in February and were ploughed up (or dug up in hard red soils). The results will be apparent at the time of the hatching of the hoppers.

2. Bagging.- Bagging was tried, but was given up when it was found that only a small proportion of the hoppers actually present on the crop could be caught.

3. Hopper trap.- A set of three long shallow tin-trays about 6 feet long were made and fitted with side pieces of stiff steel hoops. All the fields in the Bellary district being drill-sown, the trays were placed between adjacent rows of plants and joined together by cross bamboo pieces. The interior of the trays was covered with tar. The trap was dragged along the rows by 2 ropes by two coolies. As the trap moves forwards, the side and cross pieces brush-past the leaves of the jola plants, and the hoppers being disturbed jump down into the tar wherein they are caught and killed. This machine was demonstrated in several villages and was convincing, but people in only 3 villages actually took it up. Even here they left it when they found

15

hoppers coming in from neighbouring fields. In one place - Hola--gondi - the Gowd worked it energetically in 14 acres of his land and saved his jola ragi etc., at a cost of a little less than Rupees two an acre. This year it is proposed to take up big blocks in 2 or 3 places and actually work out the cost etc., of this method, improve it if possible, and demonstrate to the people.

4. Cotton crop.- Cotton is not attacked by the pest. People, therefore, when they find that nothing can be got from their jola crop, plough it up and sow cotton instead. Many peo--ple have thus saved themselves and have found that next year few hoppers hatch from such fields.

Food plants.- The chief food plants are the cereals. In pulses, pods, and flowers are the parts attacked. Cotton, gingelly and castor are free.

Severity of attack.- The hopper is equally severe in both black and red soils, but as far as observed more harm is done in red soils, as here the eggs hatch out earlier.

++++++++++++

16

G.R.S. 26]

9-5-12-15

Agri File No. 87/10

Serial No. 7

Diary No. of letter replied to 5144

No. 26228

Entoo

General and Revenue Secretariat

( )

, *the* 19 .

To

The Mycologist & Entomologist

Date of issue 12/5/11

Signed by W. R. Gr. D'Souza

Sir

I am directed to forward herewith for your information a Copy of the Note of the Entomological Assistant in the Madras Presidency on the appearance of grass hopper in the Bellary District and the remedial measures adopted therefor together with a Sketch showing the areas affected (~~for reference~~)

over.

SUBJECT.

DEPARTMENT OF AGRICULTURE. CHEMICAL LABORATORY. No. 568 GOVERNMENT OF MYSORE.

Agri 87-10-8

18

Office of the Mycologist & Entomologist,
Government of Mysore,
Bangalore, May 13th 1911.

D no 5201

From

Leslie C. Coleman, Esq., M.A., Ph.D.,
Mycologist & Entomologist to the Government of
His Highness the Maharaja of Mysore, Bangalore,

To

The Secretary to the Government of
His Highness the Maharaja of Mysore,
Genl. and Rev. Departments, Bangalore.

Sir,

In acknowledging with thanks the receipt of your letter No. R.6228/Agri.87-10-7 dated 12th May 1911 with note on the appearance of the jola grass hopper in the Bellary District I have the honor to state that a copy of this note was already in my possession.

I have the honor to be,
Sir,
Your most obedient servant,

Leslie C Coleman

Mycologist & Entomologist.

No. 3224

FROM

P. B. WARBURTON, Esq., I. C. S.,
FIRST ASSISTANT TO THE RESIDENT IN MYSORE.

To

The Dewan of Mysore.

Dated Bangalore, 29th May 1911.

Sir,

In continuation of this office letter No. 2627, dated the 2nd May 1911, I am directed to forward herewith, for the information of the Durbar, a copy of a *with 3 spare copies note* prepared by the Director of Agriculture in Bombay, on the subject of the grasshopper which attacks jowari, bajri and minor cereals, and to request that the Durbar will be so good as to furnish this Residency, for transmission to the Government of Bombay, with a report on the measures adopted in Mysore in exterminating the grasshopper pest.

I have the honour to be,
Sir,
Your most obedient servant.

For First Assistant Resident.

R. O. 2 —R. P. B.—5-1911.—1,000.

Note by the Director of Agriculture, Bombay Presidency.

The so-called bájri or jowári grass-hopper (Colemania Sphenarioides Boliv) has been reported in the Deccan and Southern Marátha Country for several years past. It was first reported as a serious pest in 1909 in the districts of Poona, Ahmednagar, Násik, Dhárwár and Belgaum and to a less degree in the districts of Sátára and Bijápur. The hoppers begin to emerge about the middle of July. At first their colour is that of dry grass, but it rapidly becomes green. Longitudinal red and blue marks then appear on the sides. In the final stage about November 1st the hoppers assume a reddish yellow colour with green and chocolate lines on the sides. In the first stage they are so small that it takes 800 of them to weigh a tola. In the last stage 22 full grown females or 31 full grown males weigh a tola, each hopper being from 1·3 inch to 1·5 inch in length. They have no sign of wings.

2. In 1909, when the pest was reported to be serious, nets of the pattern recommended by Mr. Lefroy were sent to a number of the worst-affected localities and demonstrations of their use were given. In this way it was shown that large numbers of grass-hoppers can be caught; but the cultivators took little interest in the demonstrations and expressed their belief that they were not likely to be effective. Practically no cultivators adopted the system seriously.

3. In 1910 it was decided to select two areas and see how far it was possible to completely rid them of hoppers by systematic operations and at what cost. An area "A" was selected at Belápur in the Ahmednagar district and another area "B" in the Ránebennur táluka of the Dhárwár district. In the former case the crop to be protected was bájri, in the latter case jowári.

4. *Plot A.*—An area of about 75 acres was selected containing 16½ acres of bájri, the rest of the area being sown to til, cotton, ambadi, matki and kulthi. The hoppers appeared about the middle of July and at first did some slight damage to these other crops until the bájri appeared. When the bájri appeared, they, for the most part, deserted the other crops and attacked the bájri. In the early stages bags of two sizes were used to sweep the fields, a large one 9 feet long and 2 feet wide and a smaller one 4 feet long and 2 feet wide. In still weather the larger bag was the more effective, in rough weather the smaller bag did best. The bags are made of common cloth mounted on a bamboo frame and are dragged over the ground by two men to each bag. The area was continuously swept with these bags until the crops grew too high to permit the operation. Calculating to an area of 1,000 square yards the number of hoppers that was caught in one sweep amounts to from 6,000 to 13,000. When the bájri grew to a height of about 3 feet it was found that the weight of the bags damaged the crop. To prevent this the top and bottom bamboos were removed from the bag and only the side bamboos were retained so as to keep the mouth of the bag open. Such bags did less damage, but owing to the height of the crop they were not very effective. The whole area was swept from 30 to 40 times. Later on when the bájri came into ear small hand nets were used and were fairly effective. It was found that the use of drag nets did not prevent the formation of grain even though they were used when the bájri was in flower. The net result of these operations was that considerable protection was afforded to the bájri and the crop benefited to an extent of about Rs. 4 to 5 per acre, as compared with surrounding crops which were not so treated. It was, however, found to be impossible to prevent all damage; and the cost of the operations per acre of *bájri* protected was about Rs. 3-8-0, or almost as much as the saving effected.

5. *Plot B.*—The situation here was somewhat more favourable. A block of 824 acres was selected containing 374 acres of jowári, the rest of the area being reserved for cotton and wheat. The bag used was intermediate between those mentioned in the last paragraph. The frame consisted of bamboos, 5 feet long and 2 feet wide, while the bag consisted of coarse Manchester cloth and was 4 feet deep. Hoppers appeared in July, but it was found impossible to catch them when they were very small, since they kept on the ground, and could not hop into the bag. From about August 20th to September 24th it was found possible to catch effectively in the bags. At the latter date the jowári gets too high to admit of the bags being dragged. It was found necessary to work the bags upwind only, and to employ active boys or men who would run or walk smartly. During the month that the work could be effectively carried on it was estimated that 2,368 lbs. of hoppers were caught averaging about 21,140 hoppers to the lb. The total cost incurred was Rs. 426 and amounted to about Re. 1-2-0 per acre of jowári sought to be protected. The officer who supervised the operations estimated that 75 per cent. of the hoppers had been caught, and that the protection afforded was considerable though it was difficult to say how great. He regarded the operations as fairly successful; but at the end it was obvious that the crop had suffered considerably from the hoppers. It would probably have paid the cultivators better to have ploughed up the crop at an early stage and sown late cotton.

6. I visited both plots during the progress of the operations, and my general conclusions are these:

(1) In the case of a field surrounded by waste lands or jungle where it is impossible to catch the hoppers, or by other cultivated fields the owners of which refuse to clear their lands, it is of little use for the owner to sweep his field since it will again become infested from surrounding lands.

(2) Where the jowâri or bâjri is surrounded by other growing crops which harbour the hoppers, without affording them much food, the sweeping operations are made more difficult.

(3) Where a compact block of jowâri and bâjri can be found, and the people will co-operate to sweep their fields, considerable benefit may be derived from the use of the drag-net, subject to the following considerations, viz.:

(1) Operations with the drag-net must be confined to the period between the time when the hoppers are large enough to hop into the nets and the time when the crops are so tall that they afford the hoppers too much protection from the net, and suffer damage from the net. This stage is reached when the crop is about 3 feet high. Subsequently good use can be made of a small hand net, especially when the hoppers are feeding on the flowers and grain of the crop. At this time large numbers collect on a single head and are very torpid, and can be easily caught in a small hand net.

(2) Ingenuity and common sense must be used to adapt the nets to the circumstances and to organise the gangs and work the nets so as to make the best catch. In the early morning the hoppers generally sit on the top of the plants, and can be caught most easily. On the other hand, when the crops are wet with dew or rain, the bags are apt to become too heavy and to damage the crop.

(3) Only a limited proportion of the hoppers in a field can be caught at a single sweep, and apart from those left more will enter the field from outside and more will emerge. Hoppers continue to emerge for a period of at least six weeks. The operations must therefore be frequently repeated.

(4) Consideration must be paid to the value of the crop and the cost of the operations. The work is more likely to pay in the case of a fine jowâri crop than in the case of a poor bâjri crop. As regards cost it may be said that the cultivators can clear their own lands; but it must be remembered that, even if they have spare time, field labour usually commands a good price during the rains.

(5) It is impossible to prevent all damage; but the damage can be greatly reduced.

7. In the case where the use of drag-nets has been considered as a practical proposition, it has been assumed that a number of cultivators are willing to co-operate or can be made to co-operate. It must be admitted, however, that this is not a common condition. So far as my experience goes some cultivators object to take life at all, some object to do so particularly in the month of Shrâvan (July-August), which is the only month when these operations are possible; and practically all are indifferent and sceptical. I believe, however, that in a suitable situation a few resolute men could do much to save their crops by this means.

8. I can well believe that the remedy suggested by Dr. Coleman, viz., to plough up the lands with a turn-over plough and so bring the eggs to the surface would do good, but the area affected is so great that it is not practicable. The waste lands, grass lands and head lands would also present a difficulty. In a recent report from Michgan it is stated "The Criddle mixture which is made of horse droppings, salt and Paris green has been tested and found to be the cheapest method for the wholesale destruction of grass-hoppers. Results of tests made in 1909 indicate that practically all damage can be avoided by applying this mixture early in June while the grass-hoppers are still quite small." This will be tried next rains. The operations at Ránebennur will be continued for another year.

9. The reports of the distribution of hoppers in 1910 showed that some tracts badly affected in 1909 were practically free in 1910, while some fresh tracts were affected.

G. F. KEATINGE,
Director of Agriculture.

Note by the Director of Agriculture, Bombay Presidency.

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3. In 1910 it was decided to select two areas and see how far it was possible to completely rid them of hoppers by systematic operations and at what cost. An area "A" was selected at Belápur in the Ahmednagar district and another area "B" in the Ránebennur táluka of the Dhárwár district. In the former case the crop to be protected was bájri, in the latter case jowári.

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G. F. KEATINGE,
Director of Agriculture.

Note by the Director of Agriculture, Bombay Presidency.

The so-called bájri or jowári grass-hopper (Colemania Sphenarioides Boliv) has been reported in the Deccan and Southern Marátha Country for several years past. It was first reported as a serious pest in 1909 in the districts of Poona, Ahmednagar, Násik, Dhárwár and Belgaum and to a less degree in the districts of Sátára and Bijápur. The hoppers begin to emerge about the middle of July. At first their colour is that of dry grass, but it rapidly becomes green. Longitudinal red and blue marks then appear on the sides. In the final stage about November 1st the hoppers assume a reddish yellow colour with green and chocolate lines on the sides. In the first stage they are so small that it takes 800 of them to weigh a tola. In the last stage 22 full grown females or 31 full grown males weigh a tola, each hopper being from 1·3 inch to 1·5 inch in length. They have no sign of wings.

2. In 1909, when the pest was reported to be serious, nets of the pattern recommended by Mr. Lefroy were sent to a number of the worst affected localities and demonstrations of their use were given. In this way it was shown that large numbers of grass-hoppers can be caught; but the cultivators took little interest in the demonstrations and expressed their belief that they were not likely to be effective. Practically no cultivators adopted the system seriously.

3. In 1910 it was decided to select two areas and see how far it was possible to completely rid them of hoppers by systematic operations and at what cost. An area "A" was selected at Belápur in the Ahmednagar district and another area "B" in the Ránebennur táluka of the Dhárwár district. In the former case the crop to be protected was bájri, in the latter case jowári.

4. *Plot A.*—An area of about 75 acres was selected containing 16½ acres of bájri, the rest of the area being sown to til, cotton, ambadi, matki and kulthi. The hoppers appeared about the middle of July and at first did some slight damage to these other crops until the bájri appeared. When the bájri appeared, they, for the most part, deserted the other crops and attacked the bájri. In the early stages bags of two sizes were used to sweep the fields, a large one 9 feet long and 2 feet wide and a smaller one 4 feet long and 2 feet wide. In still weather the larger bag was the more effective, in rough weather the smaller bag did best. The bags are made of common cloth mounted on a bamboo frame and are dragged over the ground by two men to each bag. The area was continuously swept with these bags until the crops grew too high to permit the operation. Calculating to an area of 1,000 square yards the number of hoppers that was caught in one sweep amounts to from 6,000 to 13,000. When the bájri grew to a height of about 3 feet it was found that the weight of the bags damaged the crop. To prevent this the top and bottom bamboos were removed from the bag and only the side bamboos were retained so as to keep the mouth of the bag open. Such bags did less damage, but owing to the height of the crop they were not very effective. The whole area was swept from 30 to 40 times. Later on when the bájri came into ear small hand nets were used and were fairly effective. It was found that the use of drag nets did not prevent the formation of grain even though they were used when the bájri was in flower. The net result of these operations was that considerable protection was afforded to the bájri and the crop benefited to an extent of about Rs. 4 to 5 per acre, as compared with surrounding crops which were not so treated. It was, however, found to be impossible to prevent all damage; and the cost of the operations per acre of *bájri* protected was about Rs. 3-8-0, or almost as much as the saving effected.

5. *Plot B.*—The situation here was somewhat more favourable. A block of 824 acres was selected containing 374 acres of jowári, the rest of the area being reserved for cotton and wheat. The bag used was intermediate between those mentioned in the last paragraph. The frame consisted of bamboos, 5 feet long and 2 feet wide, while the bag consisted of coarse Manchester cloth and was 4 feet deep. Hoppers appeared in July, but it was found impossible to catch them when they were very small, since they kept on the ground, and could not hop into the bag. From about August 20th to September 24th it was found possible to catch effectively in the bags. At the latter date the jowári gets too high to admit of the bags being dragged. It was found necessary to work the bags upwind only, and to employ active boys or men who would run or walk smartly. During the month that the work could be effectively carried on it was estimated that 2,368 lbs. of hoppers were caught averaging about 21,140 hoppers to the lb. The total cost incurred was Rs. 426 and amounted to about Re. 1-2-0 per acre of jowári sought to be protected. The officer who supervised the operations estimated that 75 per cent. of the hoppers had been caught, and that the protection afforded was considerable though it was difficult to say how great. He regarded the operations as fairly successful; but at the end it was obvious that the crop had suffered considerably from the hoppers. It would probably have paid the cultivators better to have ploughed up the crop at an early stage and sown late cotton.

6. I visited both plots during the progress of the operations, and my general conclusions are these:

(1) In the case of a field surrounded by waste lands or jungle where it is impossible to catch the hoppers, or by other cultivated fields the owners of which refuse to clear their lands, it is of little use for the owner to sweep his field since it will again become infested from surrounding lands.

(2) Where the jowári or bájri is surrounded by other growing crops which harbour the hoppers, without affording them much food, the sweeping operations are made more difficult.

(3) Where a compact block of jowári and bájri can be found, and the people will co-operate to sweep their fields, considerable benefit may be derived from the use of the drag-net, subject to the following considerations, viz.:

(1) Operations with the drag-net must be confined to the period between the time when the hoppers are large enough to hop into the nets and the time when the crops are so tall that they afford the hoppers too much protection from the net, and suffer damage from the net. This stage is reached when the crop is about 3 feet high. Subsequently good use can be made of a small hand net, especially when the hoppers are feeding on the flowers and grain of the crop. At this time large numbers collect on a single head and are very torpid, and can be easily caught in a small hand net.

(2) Ingenuity and common sense must be used to adapt the nets to the circumstances and to organise the gangs and work the nets so as to make the best catch. In the early morning the hoppers generally sit on the top of the plants, and can be caught most easily. On the other hand, when the crops are wet with dew or rain, the bags are apt to become too heavy and to damage the crop.

(3) Only a limited proportion of the hoppers in a field can be caught at a single sweep, and apart from those left more will enter the field from outside and more will emerge. Hoppers continue to emerge for a period of at least six weeks. The operations must therefore be frequently repeated.

(4) Consideration must be paid to the value of the crop and the cost of the operations. The work is more likely to pay in the case of a fine jowári crop than in the case of a poor bájri crop. As regards cost it may be said that the cultivators can clear their own lands; but it must be remembered that, even if they have spare time, field labour usually commands a good price during the rains.

(5) It is impossible to prevent all damage; but the damage can be greatly reduced.

7. In the case where the use of drag-nets has been considered as a practical proposition, it has been assumed that a number of cultivators are willing to co-operate or can be made to co-operate. It must be admitted, however, that this is not a common condition. So far as my experience goes some cultivators object to take life at all, some object to do so particularly in the month of Shrávan (July-August), which is the only month when these operations are possible; and practically all are indifferent and sceptical. I believe, however, that in a suitable situation a few resolute men could do much to save their crops by this means.

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Director of Agriculture.

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G. F. KEATINGE,
Director of Agriculture

5/6/11

28

G.R.S. 26]

Agri File No. 87/10
Serial No. 12

Diary No. of letter replied to

Rel. No. 1071
Encl: 1.

General and Revenue Secretariat
( )
, *the* 19

To

The First Asst to the
Hon'ble the Resident in Mysore

Date of issue 8-6-1911

Sir,

Signed by

Mr B Ramaswamaniya

With reference to
your letter No 32248 the
29th May 1911, requesting
to be furnished with a
report on the measures
adopted in the State in
exterminating the ~~locusts~~
grass-hopper pest, I
am directed to forward
herewith a printed extract

over.

SUBJECT.

2nd from a D. O. letter No 332
of the 16th Decr 1910 from Dr
L. C. Coleman, Government-
mycologist & Entomologist,
on the subject and to
state that a further re-
port has been called for
from the same Officer, and it
will be forwarded by you on its re-
ceipt.

I have &c

for Secy
H.C.F.II

CA

List of enclosures,

Copied by [illegible] 6/6

Examined by

GPB—20,000—23-9-10

Re-draft 30

G.R.S. 26] 3

April File No. 87/10

Serial No. 13

Diary No. of letter replied to 5752

No. A6635

General and Revenue Secretariat

(April)

, *the* 19 .

To

The Mycological and Entomological to Govt.

Sir,

I am directed to state that the Govt. of Bombay have requested to be furnished with a report of the measures adopted in this State in exterminating the Grass-hopper pest and that a copy of your D. O letter on the subject to the Dewan which has been published in the issues of the Mysore

over.

Date of issue 8.6.11

Signed by W. P. C. D'Souza

SUBJECT.

6/6

31

16th of the
Gazette of the 23rd Feb 1911
has been furnished to the
Pt Asst to the Hon'ble the Presi-
dent. I am to request
you to state whether any
other measures have been
adopted since then and
with what results. A full
& exhaustive report on the
subject will be useful
not only for the information
of the Public but also in
adopting suitable measures
in concert with other Govts
to check the pest.

I have &c

for Offg Secy

6/6/11.

List of enclosures,

Copied by

Examined by

GPB—20,000—23-9-10

DEPARTMENT OF AGRICULTURE
CHEMICAL LABORATORY.
No. 665
GOVERNMENT OF MYSORE.

Agri 87-10-14 . 32

Office of the Mycologist & Entomologist,
Government of Mysore,
Bangalore, June 10th 1911.

From

Leslie C. Coleman, Esq., M.A., Ph.D.,
Mycologist & Entomologist to the Government of
His Highness the Maharaja of Mysore, Bangalore,

To

The Secretary to the Government of
His Highness the Maharaja of Mysore,
Genl. and Rev. Departments, Bangalore.

Sir,

I have the honor to acknowledge the receipt of your letter No. R. 6635/Agri.87-10-13 dated 8th June 1911. In reply thereto I have the honor to state that a very full and exhaustive bulletin on the pest in question has been in preparation for several months. It has already been finally passed for the press and will be issued just as soon as some colored plates illustrating the bulletin are received from England. These should have been received more than a month ago and I expect them to arrive within a week.

2. In addition to the more complete English bulletin I am, of course, issuing a shorter and more popular Canarese bulletin also fully illustrated for the immediate benefit of the ryots and landholders concerned. This is also about ready for the press.

3 These bulletins contain a full account of the work already done but of course do not state what is being done this year. With regard to this latter I have the honor to state that at present a rather isolated patch of about 100 acres in the immediate neighbourhood of Honnali is being deep ploughed with an

improved plough so as to test thoroughly the effect in preventing the young hoppers from emerging from the soil. In addition plans are being made to carry out thorough and timely bagging operations in all the infested areas and to this end I am sending an officer of the Department to all the infested villages of the two districts with the object of finding out definitely how many bags will be required for in each place for the work. If possible, the ryots will be induced to cooperate and do the work themselves, but if this is not found possible it is proposed that the Department shall carry out the work and the ryots be charged for the actual expense. I may say that this is the practice followed in America, The West Indies and many other places when a serious pest has to be dealt with.

I have the honour to be,

Sir,

Your most obedient servant,

Leslie Coleman

Mycologist & Entomologist.

Pol. 100
18.7.11 Urgent

No. 4248. 34

Fin. 7.11.47

350

From

P. B. WARBURTON, Esq., I. C. S.,
FIRST ASSISTANT TO THE RESIDENT IN MYSORE.

Agri 87-10-15

To

The Dewan of Mysore.

Dated Bangalore, 18th January *191/.*

Sir,

In Dr. Coleman's letter of the 7th January 1911, a copy of which was forwarded with Mr. Balasundaram Iyer's letter No. 770 Pol., dated the 20th February 1911, the use of bags to trap the grasshoppers which attack cholum and other crops was one of the measures suggested for combating the ravages of the pest. It is reported that a number of villages in the Bellary District are affected with this pest and the Collector of that district desires to try the type of bag used in Mysore.

2. I am therefore directed, at the instance of the Government of Madras, to request that the Collector of Bellary may kindly be supplied direct with some sample bags at a very early date, as the operations must be undertaken this month, and the fact intimated to this office.

I have the honour to be,

Sir,

Your most obedient servant,

P B Warburton

First Assistant Resident.

R. O. 2—R. P. B.—5-1911.—1,000.

35

G.R.S. 26] 9.17.13.15

Agri 87-10
File No.
Serial No. 16

Diary No. of letter replied to 350

No. 1 CR514

General and Revenue Secretariat
( )
, *the* 19 .

To
L.C. Coleman Esqr M.A. Ph.D.
Mycologist & Entomologist
to Govt

Date of issue 19.7.11

Signed by Hon. P.C. D'Souza

Sir,

I am directed to state that the Collector of the Bellary District desires to try the use of the bags recommended by you, for catching young grasshoppers as a number of villages in the Bellary Dt are reported to be affected

over.

SUBJECT.

MSR
19.7.11

with the grasshopper pest
and that the Govt of Madras
therefore desire that the
Collector of Bellary may be
supplied with some sample
bags at a very early date
as the bagging operations
must be conducted during
this month. I am therefore
to request you to be good
enough to send at once some
sample bags direct to
the Collector of Bellary with
instructions for the use of
the same and intimate
the fact of your having done
so to this office with as much costs

I have &c

Para
(55) 19-7-11

for Offg Secy
19/7/11.

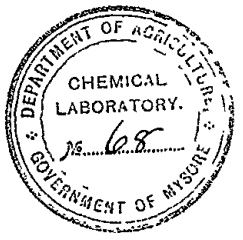
List of enclosures,

Copied by

Examined by

GPB—20,000—25-9-10

Agr. 87-10-17 37



Office of the Mycologist & Entomologist ,
Government of Mysore,
Bangalore, July 26th 1911.

From

Leslie C. Coleman, Esq., M.A., Ph.D.,
Mycologist & Entomologist to the Government of
His Highness the Maharaja of Mysore, Bangalore,

To

The Secretary to the Government of
His Highness the Maharaja of Mysore,
Genl. and Rev. Departments, Bangalore.

Sir,

As requested in your letter No. R 514/Agri.87-10-16 of 19th July 1911 I have the honor to state that I have sent two sample bags of the kind recommended by me for catching grasshoppers direct to the Collector of Bellary and sent also a copy of my bulletin on the Jola Grasshopper which contains instructions for their use. The larger of the two bags sent costs Rs. 1-11-4 and the smaller Rs. 1-7-1. I should be very glad if you would kindly ask the Collector of Bellary to send me a sum of Rs. 3-2-5 in adjustment of accounts.

I have the honor to be,
Sir,
Your most obedient servant,
Leslie C. Coleman
Mycologist & Entomologist.

38

G.R.S. 26] 46

Agri File No. 87-C

Serial No.

Diary No. of letter replied to

No. R944.

General and Revenue Secretariat
(Agri)
, *the* 19 .

To

The Mycologist and Entomologist to Govt

Date of issue 12.8.11

Sir,

Signed by Mc. P. Gr. D'Souza

With reference to your letter No 665 R dt. 10.6.11, stating that an exhaustive bulletin on the Rass-hopper pest has been in preparation, I am directed to state that a Canarese Copy of the bulletin has been received in the Office and to request that of ~~a Goode~~ ~~Shastri~~ English

over.

SUBJECT.

89

Copies thereof ~~have not been ready yet and if~~ are also

ready, ~~to transmit them~~

~~to kindly forward~~ c2 a. may be forwarded

Copies ~~both~~ to this office

both for reference here

and ~~transmission to~~ also for

the Govt of Bombay. ~~The~~

~~The Residency.~~

I have &c.

for Secy

1/8/11.

8.1.14

31/12/14

List of enclosures,

Copied by PBG.

Examined by

GPB—20,000—25-9-10

40

G.R.S. 26]

Agri File No. 87-C

Serial No. 21

Diary No. of letter replied to 516

Bdl. No. 412

General and Revenue Secretariat
(Agri)
, *the* 19

To

F. A Resident

Sir,

Date of issue 8-11-14

Signed by

With reference co
your letter no 4248 & the
18th July 1914, requesting
that the Collector of Bellary
may be supplied ~~direct~~
with some bags of the kind
recommended by Dr Coleman for combating the ravages of the Grasshopper pest etc, I am directed to state that Dr Coleman has ~~reported~~

over.

SUBJECT.

4

In his letter No 6 S & 26-7-11

that two sample bags were sent direct to the Collector of Bellary by S. Gleman with a copy of his bulletin on the Gola Grasshopper, which contains instructions for their use. I am to request that a sum of Rs. 3-2-5 being the cost of the bags referred to above (large at Re 1-11-4 & small at Re 1-7-1) may be remitted from the Collector of Bellary and be kindly caused to be remitted to me.

I have &c

For Secy.

It is reported that the cost of the bags is Rs 3-2-5 & I am to request that arrangements may be made to get the amount from the Collector of Bellary & remit the same to me

C.S.B.

G.M. Secy

2 7/8/11

List of enclosures,

Copied by 9/11/11

Examined by

GPB—20,000—25-9-10

Bellary Collector's Office,
29th November 1911.

Memo No. 1216/1911 / Acc.

From

Dr. Rao Bahadur K. Panduranga Rao Avl:
Deputy Collector in charge of Treasury,
Bellary.

Eye (R.T.R.
Leo 93292/31.

To

DIARY No. 2642

1911-1912	
SECTION	Abn Sec.
FILE No.	87-6
SERIAL No.	22.

The Secretary to the Government of Mysore
in the General & Revenue Deptt:
Bangalore.

Referring to letter No: 8884 of 14.11.11 from the First Asst: to the Resident in Mysore, I have the honor to forward herewith a R.T.R. for Rs 8.2.8 being the cost of 2 bags for trapping grass hoppers attacking Cholam & other crops supplied to this district by Dr: L.C. Coleman, Dy. entomologist to the Government of Mysore and to request that the receipt of the R.T.R. may be kindly acknowledged.

I have the honor to be
Sir
Your Most Obedient Servant

Deputy Collector.

30-11-11 30.11.11

FROM

THE TREASURY DEPUTY COLLECTOR,

BELLARY.

To

THE

Dated
Despatched } 191

No.

Enclosnre.

Subject.

2 Grubs

4

G.R.S. 26]

Agri File No. 87-0

Serial No. 23

Diary No. of letter replied to 1642

No. R 8578

General and Revenue Secretariat

(Agri)

, *the* 19 .

To

The Dy Collector in charge of Treasury, Bellary.

Date of issue 14/12/11

Signed by Mr D'Souza

Sir

I am directed to acknowledge with thanks the receipt of the R T R No 93292-31 of 29. 11- 11 for Rs 3-2-5 on account of the cost of 2 bags for catching grass-hoppers, supplied by the Collector of Bellary by Dr Coleman, Mycologist, Entomologist.

over.

forwarded with your letter No. 1216/1911 dy 29. 11- 11

SUBJECT.

From the Govt of H H the Maharaja
of Mysore

Thanks &c

For Mr Long
C/ 6/1/11.

List of enclosures,

Copied by

Examined by

GPB—10,000—28-2-11.

G.R.S. 26]

File No. 87-40
Serial No, 24

Diary No. of letter replied to 2642

No. R 8579

General and Revenue Secretariat
(April)
, *the* 19 .

To

The Officer in charge
of the Dt Treasury
Bandarban

Date of issue 14/12/11

Signed by Mr D'Souza.

Sir,

I am directed to
forward herewith a
sum of Rs 3-2-5 ~~being~~
~~the Cost of~~ received from
the Collector of Bellary on
account of the Cost of
2 bags for trapping grasshoppers
supplied to him by

over.

SUBJECT.

Dr Coleman, Mysore with 2
Enclosures to Govt and
to request that the amount
may be credited to the
Treasury under the head
XVI Principle & Rules
Minor Depts (3) Agl
Dept — Miscellaneous
receipts.

I have &c

for WS Lacy

R 3580 & 14/12/11 Hist"

Copy of the above is forwarded
to Dr Coleman, Mysore with
a Enclosure, with
reference to his letter No 68.
dt 26-7-1911.

for WS Lacy
6/12/11

(55)

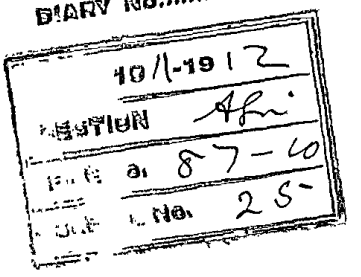
List of enclosures,

Copied by

Examined by

GPB—10,000—28-2-11.

DIARY No. 2818 47.



Rs. 3-2-5 T 24/12 Book No. 1014 No. 4 2

Bangalore District Treasury dated 15th/21 December 1911.

Received from the Secretary Gl & Rev: Department

Rupees Three

Annas two and Pies five being on account of

cost of two bags for trapping grass-hoppers.

His No. R 3579 of 14/12/11.
Agri 87-10-24

In charge of Treasury.
Bangalore District